Clean Cities
U.S. Department of Energy

Leveraging Federal Programs: U.S. DOE Clean Cities

Marcy Rood

U.S. Department of Energy

Annapolis, MD

November 21, 2002

Climate Change and Transportation in the U.S.

- The transportation sector is the fastest growing source of greenhouse gas emissions
  - Largest share (33%) of U.S. CO_2 emissions, 2001
  - Increased 22% from 1990; Expected increase 44% by 2020
  - Petroleum products are 98% of U.S. CO_2 transport sector emissions; Motor gasoline is 59%, 2001

Data from U.S. Department of Energy, Energy Information Administration

Climate Change and Transportation – The Future

- As nations grow wealthier, their people buy cars
  - Developing countries will account for more than one-half of the increase in global transport energy use
- **Future transportation demand trends will be influenced by government policies directed at reducing emissions and congestion while promoting alternative fuels, advanced technologies, and mass transit.**

Data from U.S. Department of Energy, Energy Information Administration

Potential Reductions in the Transport Sector

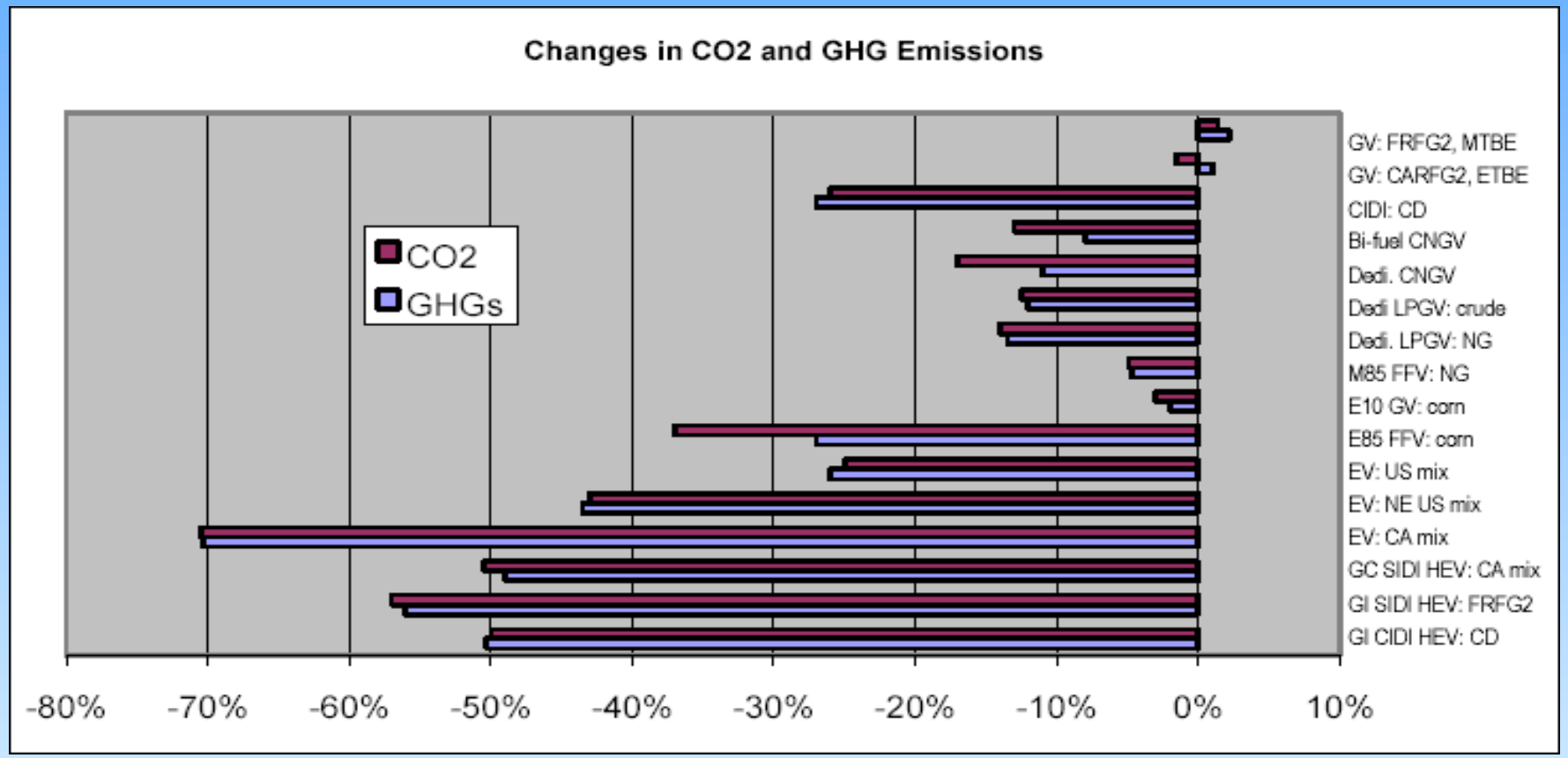
- Improve vehicle fuel efficiency
- Change vehicle and/or fuel type
- Switch transport mode
- Infrastructure development
- Reduce transport activity
- Increase load factor
- Raise quality of fuels consumed
- Research and development of new technologies

Alternative Fuel Vehicles: A Part of the Solution

- Reduce vehicle emissions
- Improve local/regional air quality
  - Reduced negative health impacts
- Use Domestic Fuel Resources
- Provide Good Long-Term Investment
- Promote Economic Development
- Reduce vulnerability from Crude Oil Price Spikes and Shortages
- Register projects for emission reductions with programs including:
  - U.S. DOE Voluntary Reporting of Greenhouse Gases Program

Clean Cities
U.S. Department of Energy

Alternative Fuel Vehicles: Lower Emissions Comparison



Argonne National Laboratory, GREET Model

Alternative Fuel Vehicles: Lower Emissions Summary

Natural Gas Vehicles (NGV)

- Light-duty NGVs realize 17% reductions in life-cycle CO2 emissions relative to equivalent gasoline vehicles due to the lower carbon content of natural gas.
- However, the overall reduction in GHGs is discounted some (down to 11%) due to the methane emissions from the leakage associated with natural gas.

Battery-Powered Electric Vehicles (EV)

- In general, EVs reduce GHG emissions by more than 40 percent
- Battery-powered EVs have no tailpipe emissions of GHGs
- Most all EV emissions are associated with generating electricity for battery recharging; these vary, depending on the power generation mix used to charge the batteries

Current AFVs in the U.S. (2002 estimates)

- **Alternative Fuel Vehicles**
  - 110,000 CNG Vehicles
  - 10,400 Electric Vehicles
  - 269,000 Propane Vehicles
- **Alternative Fuel Refueling Stations**
  - 1,280 Natural Gas Stations
  - 592 Electric Rechargers
  - 3,353 Propane Stations
  - 170 E85 Stations
- **Approximately 39 light-duty models available**
- **100 medium/heavy-duty models available**

Clean Cities
U.S. Department of Energy

Future of AFVs in the U.S.

- Advanced technology vehicles (AFVs or advanced engine technology) are projected to:
  - Reach 2.1 million vehicle sales per year by 2020
  - 12% of total projected light-duty vehicle sales
- Alcohol flexible-fueled vehicles are expected to lead advanced technology vehicle sales, reaching approximately 644,000 units by 2020.
- About 80% of advanced technology sales are a result of Federal and State mandates for either fuel economy standards, emissions programs, etc.

Federal Role in Transportation Policies

Policy	Year	Regulations & Standards	Financial Incentives	Information
EPCA (CAFE)	1975	☑		☑
AMFA	1988	☑		☑
EPACT	1992	☑	☑	☑
ISTEA & TEA-21	1991 & 1996		☑	

How the U.S. Government Supports AFVs

- **Fuel Taxes**
  - Highway Tax
  - Ethanol Production Tax Credit
- **Energy Policy Act**
  - Vehicle and Refueling Tax Deductions
  - Vehicle Acquisition Requirements for Federal, State, and Fuel Provider Fleets
  - Voluntary Market Development
    - DOE Clean Cities Program

U.S. Clean Cities Program

U.S. Department of Energy

- **A voluntary, locally based government/ industry partnership**
  - Currently 79 Active Cities
  - Over 4,800 Stakeholders
  - 181 million gallons of petroleum displaced per year
  - 32,000 metric tons of emissions reduced per year

Clean Cities
U.S. Department of Energy

Clean Cities Goals

- 1 Million AFVs Nationwide by 2010
- 1 Billion Gasoline Gallon Equivalents/Year of Alternative Fuel Used Nationwide in AFVs by 2010
- 75% of the Clean Cities Coalitions will be Self-Sustaining by 2005

Clean Cities
U.S. Department of Energy

Local Clean Cities Objectives

- Identify and Educate Fleets About Alternative Fuels
- Build Necessary Refueling Sites
- Train Drivers, Mechanics and Others
- Educate the Public
- Find Adequate Resources for AFV Projects
- Encourage Governments to Pass Legislation Favorable to AFVs

Clean Cities Products Offered

U.S. Department of Energy

Funding

- Rebates
- State Energy Grant Program
- Advancing AFV Events
- Tiger Teams

Products

- Clean Cities Web Site and Hotline
- Alternative Fuel News
- Case Studies/Fact Sheets

Tools

- Shuttle Bus Tool Kit
- Fleet Buyer's Guide (www.fleets.doe.gov)

Training

- Grants Writing
- Foundation Funding/CMAQ Funding
- Organizing Effective Coalitions
- National Clean Cities Conference
- "Tiger Teams"

Clean Cities Success Stories

U.S. Department of Energy

- **Checker Cab, Atlanta, Georgia**
  - Total of 70 CNG taxis
    (Almost all Ford Crown Victorias)
  - Reduce costs of vehicles by combining grants and rebates
  - Checker Cab CNG refueling stations are available to the public 24 hours per day
- **Northside Independent School District, Northside, TX**
  - 410 propane vehicles (some bi-fuel)
- **Denver International Airport**
  - About 1000 electric and natural gas vehicles of all types

Lessons Learned from the Clean Cities Program

- Incentives to encourage purchases are key
- Active fuel suppliers are necessary
- Drivers & mechanics must be educated
- Only high performance technologies should be selected
- Customers must be vocal about what they want in terms of vehicle types
- Coalitions are important: need strong coordinator
- Niche markets are a must

Contact Information

U.S. Department of Energy

Contact

Marcy Rood

marcy.rood@ee.doe.gov

202-586-8161

See Website

www.ccities.doe.gov

Partners

National Alternative Fuels Training Center
http://naftp.nrcce.wvu.edu

Natural Gas Vehicle Institute
www.ngvi.com

Gas Technology Institute
www.gastechnology.org

International Association of Natural Gas Vehicles www.iangv.org

Natural Gas Vehicle Coalition
www.ngvc.org

National Propane Gas Association
www.npga.org

Electric Vehicle Association of the Americas www.evaa.org